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A Microeconomic Model of Opportunistic Financial Crimes: Prosecutorial Strategy When Firms Are Too Big To Jail

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Abstract

In the cases of corporate crime, US prosecutors can lodge charges against the corporation, its managers, or both. However, the emergence of systemically important firms, most notably in the financial sector, constrains prosecutors. This paper develops a new model of corporate criminal liability and shows how the Too Big To Jail problem reduces the deterrence effect of a crime control policy relying primarily on large corporate fines. Furthermore, this paper shows how corporate criminal liability may not incentivize a Too Big to Jail firm to invest in internal controls and may even attempt to subsidize an employees' criminal activity. In the presence of Too Big to Jail firms, prosecutors should shift resources toward prosecutions of individual managers, so they bear a substantial personal risk from dealing dishonestly.

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1. Introduction

Financial crime control has moved to the forefront of public, policy, and academic discussion since 2008. Official investigations have documented widespread malfeasance in the financial sector before, during, and after the crisis (US Senate Permanent Subcommittee on Investigations 2011; Financial Crisis Inquiry Commission 2011). Despite the billions of dollars financial institutions have paid to settle criminal and regulatory actions in the United States and United Kingdom, few of their employees have faced individual prosecution for conduct relating to the

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crisis, and no executives or high-level managers have been incarcerated. In the US, many corporate prosecutions have been settled out of court using deferred prosecution agreements or non-prosecution agreements that include only limited public admissions of guilt, thereby restricting firms' exposure to civil liability. There have been relatively few cases where large corporations were found guilty of criminal charges, either at trial or through plea agreements; virtually no high-level decision makers from these companies have faced individual prosecution (Rakoff 2014; Fisher et al. 2011).

Criminal authorities' reluctance to convict large corporations is rooted in the widespread fear that a felony conviction amounts to a "corporate death penalty," which will inflict unacceptable collateral damage on employees, shareholders, and the broader economy. This belief was reinforced when the multinational accounting firm Arthur Andersen LLP collapsed following a criminal conviction for its role in the Enron scandal (Markoff, 2013). The collapse precipitated massive job losses and further consolidation of the accounting industry, even though the US Supreme Court overturned the conviction in 2005. This episode chastened many prosecutors, who fear that convicting a large corporation could destroy thousands of jobs and impose costs on shareholders who had no direct responsibility for the unlawful conduct. This reaction, along with the legal record in the years since the financial crisis, has led policy makers, commentators, and scholars to argue that some firms are so large and interconnected that they have effectively become Too Big To Jail ("TBTJ") (Holder, 2013; Sorkin, 2013; Gilchrist, 2014; Garrett, 2014).

This risk of collapse is especially acute for financial institutions, because they rely on maintaining relevant operating licenses, high credit ratings, and public credibility, all of which are vulnerable to damage following a corporate criminal conviction. Since large financial institutions are invariably connected to myriad others as transaction counterparties, the collapse of one "Too Big To Fail" ("TBTF") bank may cause a cascade of financial contagion and market panic, such as the crisis that followed the bankruptcy of Lehman Brothers Holdings Inc. in September 2008 (Brunnermeier 2009). Theoretical models have also shown that a liquidity shortfall – such as the capital loss that could result from a large criminal fine – at even one highly connected institution can be sufficient to trigger contagion in the financial sector (Gai, Haldane, and Kapadia 2011).

This paper develops a novel microeconomic model of corporate criminal liability that directly analyzes the strategic options available to financial crime prosecutors facing TBTJ firms. While there is a substantial literature on the microeconomics of corporate criminal liability, it tends to model criminal activity within a corporation as a misallocation of effort from productive to socially harmful forms (Garoupa, 2000; Polinsky and Shavell, 1993). These models reflect the microeconomics of corporate criminal negligence, such as in environmental crimes, but are less well-suited to crimes like fraud or insider trading. This paper develops a new "crime of opportunity" model that better reflects the economics of these financial crimes. Further, this paper embedded this model in the constraints facing authorities prosecuting SIFIs and analyzes how a deterrence strategy can adapt to the TBTJ problem.

The next section reviews the literature on corporate criminal liability, first from a legal perspective and then from a microeconomic perspective. The third section presents the paper's novel "crime of opportunity" model of corporate crime deterrence. The fourth section explores the strategic implications of this model for financial crime prosecutors working in the presence of TBTJ banks. Finally, the last section concludes.

2. Theory of Corporate Criminal Liability

2.1 Legal Theory of Corporate Criminal Liability

Although the legal burdens prosecutors face in establishing corporate criminal liability vary by jurisdiction, the idea that courts can convict corporations is well established in common law systems. Because companies can only act through their agents or employees, tests of corporate criminal liability hinge on attributing legal responsibility for an individual's action to the firm.

UK courts have traditionally restricted corporate criminal liability using the *identification doctrine*, which holds that the corporate body is only liable for acts taken by "the directing mind and will of the corporation" (AC 1915). This test has served to strictly limit corporate criminal liability in the UK, particularly in an age in which firms are very large, and it is difficult to prove that executives or directors are sufficiently involved in an operation's details. However, section 7 of the Bribery Act 2010, under which a company can be held liable for failing to prevent bribery, pioneered a new circumvention of the identification doctrine (UK Parliament 2010). Indeed, the UK Attorney General has suggested a new "failure to prevent fraud" offence that would follow the same model, further

weakening the shielding effect of the often insurmountable identification doctrine (Wright QC 2014).

In contrast to the UK's narrow regime, the US federal criminal law holds firms liable for the conduct of any employee who "acted, at least in part, to benefit the corporation… [and who acted] within the scope and nature of his employment" (Ku and Pepper 2008). This theory of "vicarious liability" radically expands US prosecutors' ability to impute an employee's actions to the corporation as a whole. Criminally charging a corporation does not prevent prosecutors from also charging the individuals who carried out those actions. Indeed, the US Department of Justice's official guidance indicates that "only rarely should provable individual culpability not be pursued" (US Department of Justice 2014). Thus, ignoring the challenge of finding proof of guilt beyond a reasonable doubt, financial crime prosecutors face a strategic choice: Charge the individual, the corporation, both, or neither? Shifting resources toward individual rather than corporate prosecutions thus requires only an exercise of prosecutorial discretion, not a legislative change in the criminal law.

Since the turn of the century, US prosecutors have also made extensive use of a new tool for tackling corporate crime: The Deferred Prosecution Agreement (DPA). Originally used as an alternative sentencing tool to divert young, non-violent drug offenders, the DPA has become an increasingly common resolution to investigations of corporate crime. A negotiated settlement in which the government agrees to suspend and the drop prosecution in exchange for the firm paying a large fine and agreeing to certain forms of government-supervised remediation, DPAs allow both companies and prosecutors to avoid the uncertainty and expense of a long trial. However, the lack of court-supervision, public transparency, and standards for fines and remediation has undermined the effectiveness of this new DPA regime (Garrett 2014). The US experiment with DPAs proved so successful at resolving corporate criminal cases and bringing in large financial penalties that the UK introduced the power to settle economic crime cases with DPAs into the Crime and Courts Act 2013, though none has yet been announced (UK Parliament 2013).

2.2 Microeconomic Theory of Corporate Criminal Liability

The theoretical microeconomics of crime literature follows squarely in the tradition of Becker's (1968) treatment of crime as a rational choice of an agent maximizing his expected utility. In this framework, deterrence emerges because the subject perceives the expected disutility of legal sanction to exceed the utility of breaking the law. Thus, Becker's theory suggests that authorities can achieve a socially optimal level of deterrence while trading off the certainty and severity of punishment, thereby keeping the expected disutility fixed. Becker also introduced the idea from utility theory that all punishments can be transformed into a monetary equivalent, arguing that because fines are costless transfers while other penalties have social costs, that criminal penalties should be in the form of fines, to the extent possible.

Scholars have also extended Becker's analysis to the organizational crime context, embedding the rational choice to offend within the nested principal-agent relationships flowing from government to corporation to employee. In general, these studies have modelled crime as a misallocation of effort from a productive form to a socially harmful form, in line with Tirole's standard agency theory of regulation (Garoupa 2000; Polinsky and Shavell 1993). This approach effectively models the decisions behind negligence or cost cutting, which describes the economics of corporate criminal negligence in areas like environmental or health and safety crimes. However, this type of model is less well suited to describe financial crimes such as securities fraud, misselling, or market manipulation. In this model, the agent either does or does not commit a crime, such as making a material misrepresentation in selling securities, whereas the effort allocation approach only calls an action criminal in light of exogenous factors, an apt description of criminal negligence. We represent this choice as an employee dealing dishonestly with certain unsophisticated clients because the expected profit from doing so outweighs the expected disutility from getting caught. Rather than criminal negligence, this model describes a financial "crime of opportunity."

3.0 The Crime of Opportunity Model

3.1 Outline of the law enforcement game

Often, financial crime happens when someone comes across a target of opportunity, such as a naïve investor. This section sketches a principal-agent model of financial crime by employees of large banking institutions, trying to understand how prosecutors with limited resources can allocate scarce enforcement resources to best deter these financial crimes of opportunity.

The crime of opportunity model presents the decision to commit crime as a static game with three players: the

trader, the bank, and the prosecutor. The game proceeds in the following order:

- The prosecutor receives a fixed budget L to investigate and prosecute financial crime. His objective is to achieve the maximum possible deterrence of financial crime using this budget.
- The prosecutor sets enforcement policy. The prosecutor can choose the levels of individual sanctions Γ and corporate sanctions χ. These sanctions may include several components, including financial penalties, reputational damage, and incarceration but are transformed into a monetary equivalent. The prosecutor also chooses a strategy parameter $\alpha \in [0,1]$, which represents the proportion of resources devoted to individual rather than corporate prosecution. This policy is common knowledge.
- The bank determines its expenditure c on the compliance department. This expenditure determines the probability $Q(c)$ that the bank's compliance department detects the trader's fraud. If the bank detects fraud, it handles the matter "in house," by imposing a cost of T on the trader but refrains from altering the prosecutor. Here, the purpose of funding a compliance department is for the firm to disincentivize the trader from committing fraud, thereby reducing its risk of exposure to corporate sanction χ, imposed when the prosecutor detects the crime.
- The trader encounters a client, randomly drawn from a population of investors with varying levels of sophistication. The client is characterized as representing a target of opportunity of naiveté λ, which is uniformly distributed on the interval [0,1]. Investors with low λ can be considered more sophisticated than investors with high λ, because the trader gains more from cheating naïve investors with high λ.
- If the trader's expected utility from defrauding his client U^f, including the disutility of expected punishment, is greater than his expected utility for completing the trade honestly U^h, then he commits fraud. Otherwise he completes the trade honestly.
- The bank supervises the trader. If the trader committed fraud, the firm detects and imposes a financial penalty of T on him with probability $Q(c)$, which is an increasing function of the firm's level of compliance department funding.
- The prosecutor supervises both the bank and the trader. If the trader defrauded his client, the trader and the bank can each face detection, prosecution, and sanction at independent probabilities, $P(\alpha L)$ and $\Lambda\big((1-\alpha)L\big)$ respectively. Both of these prosecution rates are determined by the prosecutor's budget L and prosecutorial priorities, represented by the portion of resources devoted to bringing individual charges α. The prosecutor's actions are independent of the bank's compliance department.

The trader's decision as to whether to defraud a particular client depends not only on that client's naiveté λ, but also on the prosecutor's enforcement policy, the bank's compliance funding c, and the cost T to the trader of being caught by the bank. Thus, any particular set of incentives defines a threshold investor whose naiveté $\hat{\lambda} \in [0,1]$ makes the trader exactly indifferent to committing fraud. The trader will defraud all clients more naive than the threshold $(\lambda > \hat{\lambda})$ and will deal honestly with any clients who are more sophisticated than the threshold $(\lambda < \hat{\lambda})$. Thus, when the threshold $\hat{\lambda}$ approaches one, only the most naïve investors, who are the most profitable targets of opportunity, will be victims of fraud. In sum, a higher λ represents a stronger deterrence regime.

The prosecutor faces two substantial constraints in determining the levels of individual and corporate sanctions in her law enforcement policy. First, it is impossible to seize from an individual trader more than his personal wealth$\overline{W}$; this also applies to the private enforcement penalty levied through the bank's internal controls. Thus, the maximum monetary penalty the trader may experience is subject to the *individual wealth constraint* $\overline{W} \geq T \geq \Gamma$, where $\overline{W}$is the trader's total recoverable wealth. If there is any need for a more aggressive individual penalty, it must take non-monetary forms, such as incarceration.

Second, and more importantly, the prosecutor is bound by the existing financial sector market structure: If a firm is TBTF, then the prosecutor cannot impose costs on the firm so large that it collapses. By introducing this *TBTJ constrain t*$\chi \leq \xi$, this study will investigate whether this new semi-protected status foofhe largest, most systemically important financial institutions requires prosecutors to change their law enforcement strategy to maintain deterrence.

3.2 The trader's decision to defraud

This crime of opportunity model positions the prosecutor as the ultimate principal and the trader as the ultimate

agent. Only the trader can actually undertake a criminal act. His decision as to whether to defraud a given client is fully determined by the client's naiveté and the disciplinary incentive structure set up by the prosecutor and the bank. The bank occupies an intermediate position, acting as a principal with respect to the trader and an agent with respect to the prosecutor.

The risk-neutral trader's expected utility for a given transaction when he commits fraud is given by:

$$U^f = \mu\widehat{R^f}(\lambda) - P(\alpha L)\Gamma - Q(c)T, \qquad (1)$$

where $\widehat{R^f}$ is the total expected return from a fraudulent transaction with a client of naiveté λ, and $\mu \in (0,1)$ is the trader's share of that return, as established by an exogenous Nash bargaining process. $P(\alpha L)$ is the probability that the trader is detected and convicted as a function of the prosecutor's law enforcement expenditure on individual prosecutions αL, conditional on having committed fraud.[†] Γ is the expected criminal sanction, which may contain both fines and incarceration. $Q(c)$ is the probability of detection by the bank's compliance department as a function of compliance department funding c, conditional on fraud having occurred.[‡] T is the expected cost to the trader of being caught by compliance. This may include costs that flow from withheld compensation, termination, civil lawsuits, and reputational damage.

Committing fraud increases the transaction's expected return by an amount $\widehat{R^f}(\lambda) - \widehat{R^h}(\lambda) = \lambda\phi$, which is directly related to the client's naiveté, indicating that defrauding more naïve clients is more profitable. The trader will always commit fraud if his expected utility from fraud is greater than the return from honest dealing, $U^f \geq U^h$.[§] From B1, the naiveté of the threshold investor vulnerable to fraud:

$$\hat{\lambda} = \frac{1}{\mu\phi}[P(\alpha L)\Gamma + Q(c)T]. \qquad (2)$$

This threshold serves as a proxy for the strength of the deterrence regime and increases with the trader's expected public and private punishment. As $\hat{\lambda}$ approaches one, only the most naïve investors are worth defrauding, whereas if $\hat{\lambda}$ falls to near zero, traders are relatively undeterred and will defraud a broader range of clients. Sensibly, as the trader's share of the fraudulent return $\mu\phi$ grows, deterrence falls.

Consistent with Becker's results, the threshold contains an additive pair of certainty-severity tradeoffs, which come from the two principals – from the prosecutor $P(\alpha L)\Gamma$ and from the bank's internal controls $Q(c)T$ – shaping the trader's incentives. Additionally, $\hat{\lambda}$ is decreasing in the trader's share μ and the potential to profit from fraud in a particular transaction ϕ, indicating that increasing the returns to fraud weakens deterrence. These are the components of the rational choice to defraud a naïve client.

Manipulating the threshold $\hat{\lambda}$ is the goal of the other players' strategies. The prosecutor wants to maximize $\hat{\lambda}$, while the bank wants to set $\hat{\lambda}$ at its profit-maximizing level. The bank's strategy is the subject of the next section.

3.3 The bank's decision to limit fraud

To the extent that the trader defrauds his clients, the bank earns a share of that illicit profit. However, the more the trader cheats, the more the firm is subject to a legal risk of corporate prosecution. The firm's strategy space is restricted to its endogenous decision to fund a compliance function, which can detect illegal activity with probability (c) conditional on the commission of fraud, where c is the level of effective compliance funding, and sanction the trader an amount T. If the compliance department detects the trader's fraud, then it handles the matter "in house" without informing the prosecutor. Thus, the firm sits on the opposite sides of two principal-agent relationships: The

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[†] The prosecutor's budget and expected trader liability are both positive, and the probability of trader conviction is an increasing function of both prosecutorial budget and the priority placed on individual liability: $L \geq 0; \Gamma \geq 0;\ P(L) \in [0,1], P(0) = 0, P_L > 0; P_\alpha > 0$, where P_L and P_α are the partial derivatives of P with respect to L and α.

[‡] The firm's expenditure on the compliance department is at least zero $c \geq 0$, and the cost of termination to the manager is positive $T \geq 0$. The probability of a corporate conviction is increasing in both prosecutorial budget and the priority placed on corporate prosecution $Q(c) \in [0,1], Q(0) = 0, Q_c > 0, Q_{CL} > 0$.

[§] To satisfy the standard *participation constraint*, $\widehat{R^h} \geq 0$.

bank acts as an agent relative to the prosecutor and an agent relative to the trader.

The bank is a risk-neutral, profit-maximizing firm that earns a share $(1-\mu)$ of the trader's gross return. The bank's profit function is:

$$B(\hat{\lambda}) = \int_0^{\hat{\lambda}} (1-\mu)\widehat{R^h} d\lambda + \int_{\hat{\lambda}}^1 \left((1-\mu)\widehat{R^f} - \Lambda\big((1-\alpha)L\big)\chi\right) d\lambda - c. \quad (3)$$

The bank's profit is determined by its share $(1-\mu)$ of the returns from both honest and fraudulent transactions, less its expenditures on compliance c and its expected corporate liability, which consists of fine χ occurring with probability $\Lambda\big((1-\alpha)L\big)$ when the trader commits fraud.[**] The prosecutor's law enforcement strategy and budget L determine this corporate criminal exposure. The integrals separate the bank's business into disjoint groups of honest and fraudulent transactions, which generate total revenue that depends on the distribution of sophistication among the bank's clients $f(\lambda)$ and the threshold naiveté $\hat{\lambda}$. The total client population has been normalized to unity. Integrating over the client population, we find the bank's profit as a function of the threshold naïveté:

$$B(\hat{\lambda}) = (1-\mu)\widehat{R^h} + \left[\tfrac{1}{2}(1-\mu)\phi\big(1-\hat{\lambda}^2\big) - \Lambda\chi\big(1-\hat{\lambda}\big)\right] - c. (4)$$

From the terms in square brackets in (4), we can see that the trader's naiveté threshold has two countervailing effects on the bank's profits: Increasing the trader's fraud (i.e. lowering the naïveté threshold $\hat{\lambda}$) generates profit from the bank's share of the fraudulent premium on each transaction. However, the second term in the brackets shows that increasing the range of clients vulnerable to fraud increases the bank's expected criminal liability, decreasing expected profits.

Substituting the definition of the threshold naiveté (2) into the bank's profit function (4) and maximizing with respect to compliance expenditure c, we find the first-order condition:

$$\frac{\partial B}{\partial c} = \left(\tfrac{1-\mu}{\mu}\right) Q_c T[P\Gamma + Q(c)T] + \mu\phi - Q_c T\Lambda\chi = 0. \quad (5)$$

This rearranges to implicitly define the firm's choice of compliance expenditure $\hat{c}$ in terms of the expected cost QT to the trader of being caught by the bank's internal controls:

$$Q(\hat{c})T = \left(\tfrac{\mu}{1-\mu}\right)\Lambda((1-\alpha)L)\chi - P(\alpha L)\Gamma - \left(\tfrac{\mu}{1-\mu}\right)\tfrac{\mu\phi}{Q_c(\hat{c})T}. \quad (6)$$

As in the effort-allocation model, the bank's exposure to criminal liability drives its decision to invest in an internal control mechanism. Note that if the bank does not face liability $(i.e. \Lambda\chi = 0)$, its ideal choice would be a negative QT, though our domain restrictions prohibit this choice. In other words, when the bank does not face corporate liability, it would choose to subsidize its employees' crimes. This dynamic may be reflected in the widespread practice of banks indemnifying their employees against criminal fines, such as in the case of subprime lender Countrywide Financial's former chief executive Angelo Mozilo. In 2010, Countrywide's acquirer, Bank of America, paid $20 million of a $67.5 million fine related to civil fraud charges that the Securities and Exchange Commission imposed on Mozilo, pursuant to an indemnification agreement in his contract (Morgenson, 2010).

According to (6), the bank's goal when investing in a compliance department is to "top up" the total expected penalty facing the trader so that the bank can keep his level of fraud at its profit-maximizing level. Thus, (6) shows that the bank's compliance funding choice $\hat{c}$ is decreasing in the trader's expected criminal liability $P\Gamma$. The private and public deterrence effects on the trader are substitutes from the bank's perspective, but it prefers the prosecutor's individual liability as this is costless for the bank. Becker's familiar certainty-severity tradeoff reemerges here. The

[**] Both compliance spending and the internal sanction are at least zero $c, \chi \geq 0$, compliance department detection is an increasing function of funding $Q_c > 0$, and the probability of corporate prosecution is an increasing function of law enforcement expenditure $\Lambda(\square) \in [0,1], \Lambda(0) = 0, \Lambda_L > 0, \Lambda_\alpha < 0$.

bank would prefer to achieve its deterrence objective by maximizing the penalty for being caught T and minimizing its supervision expenditure c as much as possible. However, T is subject to an *individual wealth constraint* $T \leq \bar{W}$ at least as tight as the one the prosecutor faces when imposing fines on bank employees.[††]

The last term in (6) relates the marginal benefit of fraud for the trader to the marginal deterrence effect from additional compliance funding. The ratio $\left(\frac{\mu}{1-\mu}\right)$ uses the two agents' shares of revenue to scale the magnitude of deterrence effects from one's perspective to the other. The ratio increases rapidly in μ, suggesting that if a bank shifts traders' compensation to rely more heavily on incentive pay tied to trading or sales revenue, the trader will have a stronger incentive to commit fraud, and the firm will have to increase its spending on supervision accordingly. This expands the economic foundations for the common critique of how the financial sector's "bonus culture" drives socially harmful decision making beyond the standard accusation of incentivizing "short termism." This model suggests that tying traders' pay more closely to sales or trading revenue exacerbates the problem of financial crime by increasing employees' private incentives to cheat. Thus, firms and prosecutors should treat employees with strongly performance-based pay structures as higher legal risks.

When the *TBTJ constraint* binds $\chi = \xi$, then there will be a level of prosecutorial threat against the trader such that the bank will not spend anything on compliance. This *zero compliance condition* is:

$$\widetilde{P\Gamma} \geq \left(\frac{\mu}{1-\mu}\right)\left[\tilde{\Lambda}\xi - \frac{\mu\phi}{Q_C(\hat{C}=0)T}\right]. \tag{7}$$

When this *zero compliance condition* holds, then the trader's incentives adjust so the TBTJ threshold naïveté becomes:

$$\hat{\lambda}_{TBTJ} = \frac{1}{\mu\phi} P\widetilde{(\alpha L)}\Gamma. \tag{8}$$

Clearly, once the *TBTJ constraint* binds and so long as the *zero compliance condition* holds, increasing individual liability through either a harsher sanction on the trader Γ or an increasing the priority placed on prosecuting individuals (i.e. raising α) will increase $\hat{\lambda}_{TBTJ}$. Indeed, just as in the effort allocation model, increasing the individual trader's liability is the only way to increase deterrence once the TBTJ problem constrains prosecutorial strategy.

4. The prosecutor's strategy to fight fraud

In traditional economics of crime models, the government's objective is to reduce crime to a socially efficient level. But in reality, prosecutors often have a different goal: Deterring crime as much as possible with the resources available under exogenously fixed budgets. Our crime of opportunity model adopts this perspective and asks how a prosecutor may best allocate her resources to reduce financial crimes by employees of TBTJ financial institutions. Rather than addressing overall social priorities or criminal law structure, this model serves as a guide for the prosecutors looking to get the greatest deterrence "bang for her buck." Thus, our prosecutor's objective is to maximally deter fraud given fixed resources L; as noted above, this is equivalent to maximizing the threshold naiveté $\hat{\lambda}$. The prosecutor's strategy space includes the structure of individual Γ and corporate χ sanctions and the proportion of resources spent on individual prosecutions α.

The problem of minimizing social harm is equivalent to maximizing$\hat{\lambda}$. Intuitively, as $\hat{\lambda}$ approaches unity, only the most naïve investors will be defrauded, reflecting a lower social cost than when the trader finds it profitable to defraud a broader range of clients. When neither the *individual wealth constraint* nor the *TBTJ constraint* bind, the prosecutor can always increase deterrence by increasing enforcement with more resources, since $\partial\hat{\lambda}/\partial L > 0$.[‡‡] Thus,

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[††] The bank's punishment includes only money, employment termination, and reputational costs while the criminal prosecutor can impose not only these punishments but also incarceration. Thus, $\Gamma > T$ when the *individual wealth constraint* binds.

[‡‡] Maximizing (2) and taking the implicit derivative Q_L from (6) shows that $\frac{\partial\hat{\lambda}}{\partial L} = \frac{\Lambda_L\chi}{(1-\mu)\phi} + \left(\frac{\mu}{1-\mu}\right)\frac{\mu\phi}{Q_{CL}(\hat{c};\gamma)T} > 0$ throughout the relevant parameter space, meaning that increasing the prosecutor's budget will always allow her to increase deterrence.

the investigative budget constraint will always bind, so we will not consider increasing overall investigative resources as a live choice for the prosecutor. The prosecutor can, however, employ discretion to adjust both the relative priority placed on individual versus corporate prosecutions and the penalties imposed on the bank and trader.

First, consider the effect of shifting resources toward individual prosecutions. Without a binding TBTJ constraint, increasing α can have two countervailing effects on deterrence: Shifting resources to individual prosecutions increases the expected public enforcement penalty while reducing the firm's compliance spending, and thus lowering the trader's expected penalty from private enforcement. The net result is, in general, indeterminate. When the TBTJ constraint fully binds and the *no compliance condition* holds, however, the firm already lacks an incentive to fund internal controls, so when the prosecutor reduces the firm's expected penalty there is no more compliance spending to cut. Thus, at the TBTJ constraint, shifting resources toward individual prosecution improves deterrence without the countervailing effect that normally complicates prosecutorial strategy.

Second, consider increasing the trader's punishment Γ. In general, when the TBTJ constraint does not bind, increasing the trader's punishment fails to improve deterrence:

$$\frac{\partial \hat{\lambda}}{\partial \Gamma} = \frac{1}{\mu\phi}[P(\alpha L) + Q_{\Gamma}(c;\gamma)T] = \frac{1}{\mu\phi}\left[P(\alpha L) + T\left(-\frac{P(\alpha L)}{T}\right)\right] = 0. \qquad (9)$$

Confounding a naïve extension of Becker's logic, (9) shows how the firm withdraws funding for internal controls to keep the level of fraud at its profit-maximizing level, so deterrence remains constant. However, when the TBTJ constraint binds and the *no compliance condition* holds, the bank is already spending nothing on compliance, so it cannot draw down risk for the trader to offset the increased risk from public sanction. Thus, increasing the threat of criminal penalties for employees of TBTJ banks should be an effective way of increasing deterrence when the prosecutor cannot credibly increase the legal risk facing a systemically important firm. This strategy would not be as effective in the absence of the TBTJ constraint. Thus, prosecutors facing TBTJ firms have an economic justification for shifting scarce resources toward individual prosecutions.

5. Conclusion

The existence of Too Big to Fail firm presents a thorny problem for corporate crime control policy. This paper presents a novel microeconomic model of corporate criminal liability in the context of preventing "crimes of opportunity" by a firm's employees. This model reflects the microeconomics of financial crimes such as securities fraud, money laundering, and insider trading better than the dominant "effort allocation" models. The model also includes a TBTJ constraint, which illustrates how prosecutorial strategy might adapt to the current structure of the financial sector, among others.

When a firm is systemically important, it will not perceive a corporate criminal sanction sufficiently harsh to cause its collapse to be a credible threat. If this "Too Big To Jail problem" constrains prosecutors, they will struggle to incentivize firms to properly monitor their own employees by investing in internal controls. To the extent that financial crime deterrence should be stronger, then the existence of TBTJ firms justifies prosecutors shifting resources toward individual prosecutions.

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References

AC. 1915. Lennard's Carrying Co v Asiatic Petroleum Co Ltd 705.

Brunnermeier, Markus, K. 2009. Deciphering the Liquidity and Credit Crunch 2007–2008." Journal of Economic Perspectives 23 (1): 77–100. doi:10.1257/jep.23.1.77.

Financial Crisis Inquiry Commission. 2011. The Financial Crisis Inquiry Report: Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States. Government Printing Office.

Fisher QC, Jonathan, With Claire Cregan, James Di Giulio, and Jodi Schutze. 2011. Economic Crime and the Global Financial Crisis. Law and Financial Markets Review 5 (July): 276–89.

Gai, P., Andrew, H., Sujit, K., 2011. Complexity, Concentration and Contagion. Journal of Monetary Economics 58 (5): 453–70.

Garoupa, N., 2000. Corporate Criminal Law and Organization Incentives: A Managerial Perspective. Managerial and Decision Economics 21 (6): 243–52.

Garrett, B.L., 2014. Too Big to Jail: How Prosecutors Compromise with Corporations. Vol. 3. Harvard University Press.

Gilchrist, G.M., 2014. Special Problem of Banks and Crime. The University of Colorado Law Review 85 (1).

Holder, E. 2013. Transcript : Attorney General Eric Holder on 'Too Big to Jail. American Banker. American Banker. http://www.americanbanker.com/issues/178_45/transcript-attorney-general-eric-holder-on-too-big-to-jail-1057295-1.html.

Ku, M., Lee, P., 2008. Corporate Criminal Liability. Am. Crim. L. Rev. 45. HeinOnline: 275.

Markoff, G., 2013. Arthur Andersen and the Myth of the Corporate Death Penalty: Corporate Criminal Convictions in the Twenty-First Century. U. Pa. J. Bus. L. 15: 797–842.

Polinsky, A., Mitchell, Steven, S., 1993. Should Employees Be Subject to Fines and Imprisonment given the Existence of Corporate Liability? International Review of Law and Economics 13 (3): 239–57.

Rakoff, J.S., 2014. The Financial Crisis: Why Have No High-Level Executives Been Prosecuted? The New York Review of Books, no. January 9, 2014.

Sorkin, A.R., 2013. Realities Behind Prosecuting Big Banks. New York Times, March 11.

UK Parliament, 2010. Bribery Act 2010. United Kingdom.

US Department of Justice, 2014. United States Attorney Manual – Principles of Federal Prosecution of Business Organizations Sec. 9-28.000. Washington DC.

US Senate Permanent Subcommittee on Investigations, 2011. Wall Street and the Financial Crisis: Anatomy of a Financial Collapse. Washington DC.

Wright Q.C, Jeremy, 2014. Attorney General's Keynote Address to the 32nd Cambridge International Symposium on Economic Crime. https://www.gov.uk/government/speeches/attorney-generals-keynote-address-to-the-32nd-cambridge-international-symposium-on-economic-crime-on-tuesday-2-september-2014.